IN THE CLAIMS:

Amended claims follow:

1.   (Original) A method for programmable pixel processing in a computer graphics pipeline, comprising:

(a)   receiving pixel data from a source buffer;

(b)   performing programmable operations on the pixel data in order to generate output, wherein the operations are programmable by a user utilizing instructions from a predetermined instruction set; and

(c)   storing the output in a register;

(d)   wherein the instructions include a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum instruction, fraction instruction, exponential base two (2) instruction, and logarithm base two (2) instruction.

2.   (Original) The method as recited in claim 1, wherein the output stored in the register is used in performing the programmable operations on the pixel data.

3.   (Original) The method as recited in claim 1, wherein the pixel data includes a position, a pixel diffuse color, a specular color, a fog value, and a plurality of texture coordinates.

4.   (Original) The method as recited in claim 1, wherein the pixel data is selected from the group consisting of a position, a pixel diffuse color, a specular color, a fog value, and a plurality of texture coordinates.

5.   (Original) The method as recited in claim 1, and further comprising performing an operation involving the output, the operation selected from the group consisting of a scissor operation,

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a color format conversion, an alpha test operation, a z-buffer/stencil operation, a blend operation, a logic operation, a dither operation, and a writemask operation.

6.   (Original) The method as recited in claim 1, wherein further standard operations are performed on the pixel data utilizing a standard graphics application program interface (API).

7.   (Original) The method as recited in 1, wherein the output includes a color value and a depth value.

8.   (Original) The method as recited in claim 1, and further comprising negating the pixel data prior to performing the programmable operations thereon.

9.   (Previously Amended) The method as recited in claim 1, and further comprising swizzling the pixel data prior to performing the programmable operations thereon, wherein the swizzling includes a component re-mapping.

10.   (Original) The method as recited in claim 1, wherein the programmable operations includes a texture fetch operation.

11.   (Original) The method as recited in claim 10, wherein the texture fetch operation involves a slope.

12.   (Original) The method as recited in claim 10, wherein the texture fetch operation is capable of being used in a level of detail (LOD) calculation.

13.   (Original) The method as recited in claim 1, wherein the programmable operations support multiple levels of precision.

14.   (Original) The method as recited in claim 13, wherein the levels of precision include full floating point, half floating point, and fixed point.

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15.   (Original) The method as recited in claim 13, wherein the programmable operations are capable of converting the pixel data from a first level of precision to a second level of precision.

16.   (Original) The method as recited in claim 1, wherein the programmable operations are capable of clamping the pixel data for packing the pixel data into a destination.

17.   (Original) The method as recited in claim 1, wherein condition codes are initialized prior to the programmable operations being performed.

18.   (Original) The method as recited in claim 1, wherein the programmable operations are capable of removing the pixel data.

19.   (Cancelled)

20.   (Previously Amended) A computer program product for programmable pixel processing in a computer graphics pipeline, comprising:

(a)   computer code for receiving pixel data from a source buffer;

(b)   computer code for performing programmable operations on the pixel data in order to generate output, wherein the operations are programmable by a user utilizing instructions from a predetermined instruction set; and

(c)   computer code for storing the output in a register;

(d)   wherein the instructions include a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum instruction, fraction instruction, exponential base two (2) instruction, and logarithm base two (2) instruction.

21.   (Previously Amended) A system for programmable pixel processing, comprising:

(a)   a source buffer for storing pixel data;

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(b)   a functional module coupled to the source buffer for performing programmable operations on the pixel data received therefrom in order to generate output, wherein the operations are programmable by a user utilizing instructions from a predetermined instruction set; and

(c)   a register coupled to the functional module for storing the output;

(d)   wherein the instructions include a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum instruction, fraction instruction, exponential base two (2) instruction, and logarithm base two (2) instruction.

22.   (Currently Amended) A method for programmable pixel processing in a computer graphics pipeline, comprising:

(a)   receiving pixel data from a source buffer;

(b)   performing programmable operations on the pixel data in order to generate output, wherein the operations are programmable by a user utilizing pixel data-related instructions from a predetermined instruction set, and the programmable operations support multiple levels of precision; and

(c)   converting the pixel data from a first level of precision to a second level of precision;

(d)   wherein the pixel data-related instructions include a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum instruction, fraction instruction, exponential base two (2) instruction, and logarithm base two (2) instruction, set on less than instruction for setting a destination to a predetermined number if a first source is less than a second source, set on greater or equal than instruction for setting a destination to a predetermined number if a first source is greater or equal than a second source, and kill pixel instruction;

(e)   wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector component re-mapping.

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23.   (Currently Amended) A method for programmable pixel processing in a computer graphics pipeline, comprising:

(a)   receiving pixel data from a source buffer;

(b)   performing programmable operations on the pixel data including a texture fetch in order to generate output, wherein the operations are programmable by a user utilizing pixel data-related instructions from a predetermined instruction set; and

(c)   storing the output in a register;

(d)   wherein the pixel data-related instructions include a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum instruction, fraction instruction, exponential base two (2) instruction, and logarithm base two (2) instruction, set on less than instruction for setting a destination to a predetermined number if a first source is less than a second source, set on greater or equal than instruction for setting a destination to a predetermined number if a first source is greater or equal than a second source, and kill pixel instruction;

(e)   wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector component re-mapping.

24.   (Currently Amended) A method for programmable pixel processing in a computer graphics pipeline, comprising:

(a)   determining whether the graphics pipeline is operating in a programmable mode;

(b)   performing programmable operations on pixel data in order to generate output if it is determined that the graphics pipeline is operating in the programmable mode; and

(c)   performing standard operations on the pixel data in order to generate output in accordance with a standard graphics application program interface if it is determined that the graphics pipeline is not operating in the programmable mode;

(d)   wherein the pixel data-related instructions are provided includeing a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum

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instruction, fraction instruction, exponential base two (2) instruction, and logarithm base two (2) instruction, set on less than instruction for setting a destination to a predetermined number if a first source is less than a second source, set on greater or equal than instruction for setting a destination to a predetermined number if a first source is greater or equal than a second source, and kill pixel instruction;

(e)   wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector component re-mapping.

25.   (Original) The method as recited in claim 24, wherein the standard graphics application program interface includes OpenGL®.

26.   (Currently Amended) A computer program product for programmable pixel processing in a computer graphics pipeline, comprising:

(a)   computer code for determining whether the graphics pipeline is operating in a programmable mode;

(b)   computer code for performing programmable operations on pixel data in order to generate output if it is determined that the graphics pipeline is operating in the programmable mode; and

(c)   computer code for performing standard operations on the pixel data in order to generate output in accordance with a standard graphics application program interface if it is determined that the graphics pipeline is not operating in the programmable mode;

(d)   wherein the pixel data-related instructions are provided includeing a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum instruction, fraction instruction, exponential base two (2) instruction, and logarithm base two (2) instruction, set on less than instruction for setting a destination to a predetermined number if a first source is less than a second source, set on greater or equal than instruction for setting a destination to a predetermined number if a first source is greater or equal than a second source, and kill pixel instruction;

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(e)   wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector
component re-mapping.

27.   (Original) The computer program product as recited in claim 26, wherein the standard
graphics application program interface includes OpenGL®.

28.   (Currently Amended) A system for programmable pixel processing in a computer graphics
pipeline, comprising:

(a)   means for determining whether the graphics pipeline is operating in a programmable mode;

(b)   means for performing programmable operations on pixel data in order to generate output if it
is determined that the graphics pipeline is operating in the programmable mode; and

(c)   means for performing standard operations on the pixel data in order to generate output in
accordance with a standard graphics application program interface if it is determined that the
graphics pipeline is not operating in the programmable mode;

(d)   wherein ~~the~~ pixel data-related instructions are provided include~~ing~~ a no operation instruction,
move instruction, multiply instruction, addition instruction, multiply and addition instruction,
reciprocal instruction, reciprocal square root instruction, three component dot product
instruction, four component dot product instruction, minimum instruction, maximum
instruction, fraction instruction, exponential base two (2) instruction, ~~and~~ logarithm base two
(2) instruction, set on less than instruction for setting a destination to a predetermined number
if a first source is less than a second source, set on greater or equal than instruction for setting
a destination to a predetermined number if a first source is greater or equal than a second
source, and kill pixel instruction;

(e)   wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector
component re-mapping.

29.   (Original) The computer program product as recited in claim 29, wherein the standard
graphics application program interface includes OpenGL®.

30.   (Currently Amended) A method for programmable pixel processing in a computer graphics
pipeline, comprising:

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(a)   determining whether the graphics pipeline is operating in a programmable mode;

(b)   performing programmable operations on pixel data in order to generate output if it is
       determined that the graphics pipeline is operating in the programmable mode; and

(c)   performing standard operations on the pixel data in order to generate output in accordance
       with a standard graphics application program interface if it is determined that the graphics
       pipeline is not operating in the programmable mode;

(d)   wherein the programmable operations <u>are pixel data-related and</u> include a no operation,
       texture fetch, move, derivative, multiply, addition, multiply and addition, reciprocal,
       reciprocal square root, three component dot product, four component dot product, distance
       vector, minimum, maximum, pack, unpack, set on less than <u>for setting a destination to a</u>
       <u>predetermined number if a first source is less than a second source</u>, set on greater or equal
       than <u>for setting a destination to a predetermined number if a first source is greater or equal</u>
       <u>than a second source</u>, floor, fraction, kill pixel, exponential base two (2), logarithm base two
       (2), and light coefficients;

(e)   <u>wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector</u>
       <u>component re-mapping</u>

31.   (Currently Amended) A method for programmable processing in a computer graphics
       pipeline, comprising:

(a)   receiving pixel data including texture information; and

(b)   performing programmable operations on the pixel data in order to generate output, wherein
       the operations are programmable by a user utilizing <u>pixel data-related</u> instructions from a
       predetermined instruction set;

(c)   wherein the operations include a mathematical operation for altering the texture information
       of the pixel data;

(d)   wherein the <u>pixel data-related</u> instructions include a no operation instruction, move
       instruction, multiply instruction, addition instruction, multiply and addition instruction,
       reciprocal instruction, reciprocal square root instruction, three component dot product
       instruction, four component dot product instruction, minimum instruction, maximum
       instruction, fraction instruction, exponential base two (2) instruction, ~~and~~ logarithm base two
       (2) instruction<u>, set on less than instruction for setting a destination to a predetermined number</u>

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if a first source is less than a second source, set on greater or equal than instruction for setting a destination to a predetermined number if a first source is greater or equal than a second source, and kill pixel instruction;

(e)   wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector component re-mapping.

32.   (Currently Amended) A method for programmable processing in a computer graphics pipeline, comprising:

(a)   providing pixel data including texture information; and

(b)   performing programmable operations on the pixel data in order to generate output, wherein the operations are programmable by a user utilizing pixel data-related instructions from a predetermined instruction set;

(c)   wherein the operations include a mathematical operation for altering the texture information of the pixel data;

(d)   wherein the pixel data-related instructions include a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum instruction, fraction instruction, exponential base two (2) instruction, and logarithm base two (2) instruction, set on less than instruction for setting a destination to a predetermined number if a first source is less than a second source, set on greater or equal than instruction for setting a destination to a predetermined number if a first source is greater or equal than a second source, and kill pixel instruction;

(e)   wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector component re-mapping.

33.   (Currently Amended) A method for programmable processing in a computer graphics pipeline, comprising:

(a)   receiving pixel data including color information; and

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(b)   performing programmable operations on the pixel data in order to generate output, wherein the operations are programmable by a user utilizing <u>pixel data-related</u> instructions from a predetermined instruction set;

(c)   wherein the operations include a mathematical operation for altering the color information of the pixel data;

(d)   wherein the <u>pixel data-related</u> instructions include a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum instruction, fraction instruction, exponential base two (2) instruction, ~~and~~ logarithm base two (2) instruction, <u>set on less than instruction for setting a destination to a predetermined number if a first source is less than a second source, set on greater or equal than instruction for setting a destination to a predetermined number if a first source is greater or equal than a second source, and kill pixel instruction;</u>

<u>(e)   wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector component re-mapping.</u>

34.   (Currently Amended) A method for programmable processing in a computer graphics pipeline, comprising:

(a)   receiving pixel data including texture information and color information; and

(b)   performing programmable operations on the pixel data in order to generate output, wherein the operations are programmable by a user utilizing <u>pixel data-related</u> instructions from a single instruction set;

(d)   wherein the <u>pixel data-related</u> instructions include a no operation instruction, move instruction, multiply instruction, addition instruction, multiply and addition instruction, reciprocal instruction, reciprocal square root instruction, three component dot product instruction, four component dot product instruction, minimum instruction, maximum instruction, fraction instruction, exponential base two (2) instruction, ~~and~~ logarithm base two (2) instruction, <u>set on less than instruction for setting a destination to a predetermined number if a first source is less than a second source, set on greater or equal than instruction for setting</u>

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a destination to a predetermined number if a first source is greater or equal than a second source, and kill pixel instruction;

(e)   wherein the pixel data is swizzled, and the swizzling includes a pixel-related vector component re-mapping.

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